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THE BIOLOGIST

A Quarterly Journal Promoting Research
Interest in the Biological Sciences

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No. 1

REMINISCENCES AND IMPRESSIONS OR THE TORCH AND THE TIN CAN

By DR. E. C. CASE

Beta '20 Hon.

I am not here entirely of my own volition. No one goes to confession willingly, or without some external stimulus. The young man who gained my consent to make this attempt at a summarization of some experiences and impressions based his arguments on the entirely erroneous assumption that a man of my years *must* have had some ideas. Having yielded to his persuasion, largely because the date set was still months away, I am finally compelled to meet the occasion. So I stand before you, just an elder member of Phi Sigma, or a Dutch uncle, talking to younger members for a short time and craving your pardon if I seem more garrulous than coherent.

I must confess to some embarrassment in framing the wording of my references and appeals to this group of investigators. In these days of

This paper was read at an open monthly meeting of Phi Sigma, Beta Chapter, at the University of Michigan, 20 May 1946. In response to requests from friends and former students of Dr. Case who were not able to be present, it is being reproduced.

sadly mixed costumes on the campus, it would perhaps be excusable if I adhered to the old usage of addressing all workers and students as *he*, but in an evening gathering there are still conventional archaisms which render the pronoun quite visibly inappropriate. If the ladies present will forgive the speaker's inadequacies of language and supply the necessary *s* to make the appropriate change, when the speaker slips, he will be profoundly grateful.

It is always something of a shock to a once active worker when he realizes that he is dealing as an equal with those who were his students in years gone by, and with the phylogenetic additions to those students even unto the second and third generations. A few days ago a student came to ask for some hints and in conversation named with great respect and even some awe the professor with whom he was working. I shall always cherish the memory of that student's gasp of amazement when I said, "Yes, he ought to be some good. I taught him

a lot of what he knows." It is pleasant to live where one has worked and to note (sometimes to the secret amazement of former instructors) how the children grow up and become intelligent and respected members of the craft and the community.

In the introspection of sleepless nights, when his old slips, mistakes, and errors sit on his bed posts and grin in happy malice, the old professor comes to liken himself to some sturdy old tree of the forest, bent and gnarled, with a rough bark, and scarred with badly healed wounds,—withal a little dead at the top, *but* surrounded with a vigorous growth of young saplings and suckers springing from its roots.

It will, perhaps, be pardonable if such a person views the imposing facade of intellectual progress with something less than the austere earnestness of a young and devoted acolyte oppressed with his first convictions of seriousness and integrity in the pursuit of truth. Realizing that honest but defeated endeavor and misplaced confidence in many men and theories may have bred some cynicism that would be out of place in an address that should traditionally keep to a high level, I have endeavored to introduce into the title of this little talk something of seriousness punctuated by a few wry grins of reality. The title that has been given you was only for publication. As the White Knight said to Alice, "It's not its name, but what it is called." The real title is:—

THE TORCH AND THE TIN CAN

The Torch and the Tin Can. Hopefulness and Habit. The desire to awaken inspiration and the formation of habits which will cling through the declining years like a tin can to a dog's tail,—not to be lost nor escaped from while the ability to work remains. Let us divide the topics and see where a contemplation of them will lead us.

The Torch is the conventional symbol of the old and wearied worker struggling on until his failing powers demand that the overspent senior relax the symbol with dignified abandonment into the hands of the young and vigorous disciple who grasps it with reverence and speeds along the indi-

cated path. A beautiful ideal, worthy of all the best in art and literature. What is the reality?

The crabbed and overspent sage relaxes grudgingly, and with no exhibition of confidence in his successor, a symbol that is worn and bent and dented; it is full of holes and leaks oil badly; the light is dimmed with a haze of uncertainty. The recipient accepts the venerable relic with a critical air and something of a sniff of distrust; he implies, if he does not state boldly, that the pattern is archaic; that the ancient flamifer seems to have attempted, several times, to reshape it and that the parts do not fit; that it is milled to very broad limits of error; that the use of oil makes it smelly and does not afford the brilliance of electricity. Then, instead of starting to bear it on, he very likely sits down to revamp the whole apparatus. He may not lack in respect toward the elder but the torch has got to be a 1946 model. To show that all this is not due to a personal peeve but is really a generic description of the situation, I quote a few words from a very recent column by Malcolm Bingay in the *Detroit Free Press*. Since the publication of his successful book, *Detroit is My Home City*, he has evidently been called upon to make inspirational addresses to groups of youth. He visualizes his audience and his appearance before them. The language is not academic, but the spirit is very much as I have outlined it.

"What can a world-weary old coot like myself offer them? Nothing! They know more than I do because their eyes are on the future. They are not suffering from inhibitions of the past. They have the magnificent courage of youth. They are unafraid. They feel quite certain that once they get hold of things they can straighten everything out.

And they will! What America needs most is a lot of first class funerals. We oldsters have made such a mess of things through the past 50 years that a new start is required. Your attention, please, ladies and gentlemen: Youth now batting for Whiskers.

They are always looking at the seams of your shirt to see if the stuffing is leaking out."

I would call your attention to a last sentence. I wish to return to it.

"We must first see to it that young men and women are trained to an understanding of the science of government and the fundamentals of economics."

The picture I have painted for you may seem very discouraging, but it is all right and proper. It's the way we do things. In a democracy everyone has a right to talk, but there are two groups who should not talk: (1) those who do not know enough to talk, (2) those who do not know enough *not* to talk. The articulate animal—man—utters an immense amount of verbiage and then spends years scratching it over to see if anything worth while was included. The Bible is generally assumed to be right in all particulars, but sometimes it sounds a little off key. In the Proverbs it says that "in a multitude of counsellors there is safety." Those of you who have searched the literature of your subject know that these words are not strictly true. Perhaps the writers of the King James version did not get the translation just as it should have been.

Now, with your patience and permission, I am going to be a bit serious for a very few minutes. In order that you may get some idea of what I am trying to say, I shall speak under sub-heads from which I shall probably wander with great freedom and loquacity.

1. *The accumulation of human experience and the vast amount of debris resulting from the process.* Science consists not in advance alone. It implies the storage of accumulated facts, the availability of data gained by experience, the correlation of seemingly isolated matter, and the synthesis of results. The realization of radar and the release of atomic energy was not accomplished by a *coup de force* of genius from nothing. It was done by the combination of many facts, some seemingly with very remote relations to the final result. New points, new facts, new ideas were painfully won by isolated workers. These were published, tested, verified by other workers, and made available as a part of the general sum of human experience to all

workers; finally by a synthesis of known material the final step was taken. The accumulation of data was long and tedious; the result a slowly incubated reward that in its final stage came in a somewhat startling burst. This is one secret of the torch, the accumulation of human experience, called knowledge, which makes each advance more ready and more orderly.

Personally I do not reckon the release of atomic energy—the result of years of seemingly wild experimentation and theorizing, but based on a slow sifting of theory, rejection of false premises and false reasoning, retention of the minimal good—this I do not reckon as equal in mental accomplishment to the discovery of the simple knot. He,—or *she*, if it so was,—who evolved the first knot, spent no hours in the library, compiled no extensive bibliography, received no degree. Out of his own mind, with his own fingers, he and he alone (unless there was a lady driving from the back seat) tied the knot in a strip of hide or recognized one in a tangle of vines or guts. It was no compilation of others' work, it was something new to the world, the work of an untrained and untrammelled mind. That is the reason the early culture stages of man were so lengthy. It took a long time to learn to tie a knot; some people cannot tie a good one today. As human experience accumulated, each successive stage was less and less prolonged, because the accumulation of human experience furnished a background and a mine of suggestion and stimulus. There are many who question that the mind of man is more keen today than it was in the earliest stone age. We have learned many new tricks and new facts which we can pass on, and learn in our early childhood as a basis for advance. This has been so cumulative that each new stage, marked by some widely adopted new pattern of thought or action, is shortened, until from the thousands of years of the Eolithic stage of culture, the few years of your present speaker have compassed the time from the introduction of the electric light and the telephone to the release of atomic energy. The human mind may have changed little, but it has been enriched and stimu-

lated by the vast resources of accumulated experience.

All advance is by thinking it up and trying it out, or by having it happen and worrying out the cause and method. Both paths involve an endless number of new ideas and an immense amount of debris. The by-products of action may seem useless; time was when the useless and dangerous gasoline derived from the distillation of kerosene from mineral oil posed a big problem in disposal. Real debris less commonly becomes a usable thing in the end. But product, by-product, and debris are all parts of the accumulated experience of man. The material by-product and debris is by no means the sole loss. There is an enormous wastage in the process of thought. Someone long ago commented on the immense amount of irrelevant thought which accompanies the solution of every problem.

Unhappily the debris of the thinking process cannot be at once recognized and discarded. It must be saved until it is refuted. One comes to see in our great libraries a dumping ground of futile thought, well intentioned or foolish, but necessarily preserved on the off chance that a germ of truth may be hidden in it. One can picture some disillusioned sage coughing in the smoke of the fire that destroyed the Alexandrine Library, but experiencing a wry content as he reflected on how much trash was ceasing to plague the lives of scholars. Much of the content of modern libraries would materially alleviate the coal shortage.

2. *Lack of clarity in thought and obscurity in expression.* The debris of thought is not more an impediment to the record of human experience than is the method of its transmission. In whatever language the record was kept, it frequently suffered from a lack of clarity and consistency. Aside from the charlatanism which induced pseudoscholars to attempt to give worth to their lucubrations by the use of codes, ciphers, recondite allusions and newcoined words, there has been through the ages a disinclination on the part of scholars to endure the drudgery which leads to the ability to write decent English, or its equivalent

in any language. The readers must know the idiom of the language and the spirit of the people who wrote. They must be able to recognize whether the intention was to relate the facts truthfully or to promote the acceptance of a theory or an ideology. In facing the great mass of obscure writing, one feels a great deal of sympathy with Hans Breitmann, whom I sincerely hope you know, as he commented on the writings of two of the great men of his native land.

Ash der Haegel says von his Sysdem, ders only vun man knows what der Teufel it ment,—und he gant dell. Und der Jean Paul Richter, too. He said, 'Gott knows dot I meint some dings ven virst das buch I writ, but Gott only knows vat das buch meint now, vor I haf vorgotten it.'

Then there is the gibe directed at prolix writers; originally attributed to the great pioneer English biologist, Ray, it has taken many forms and been placed on the tongues of many men. "Those writers who, as the squid, do obscure themselves in the clouds of ink which they emit."

There is the lamentable case where a worker has invented a new word and is swollen with pride because he thinks he has had a new idea. This case has a multiplicity of phases, ranging from the obviously absurd to the honest, reasoned conviction based on erroneous premises. As an example of the "patently impossible and vain" (I am not above citing even Kipling in a scientific address), I quote from a pamphlet on the origin of animal species published in 1945. "Hence my conception of a Central Chaonitic Body educated by millions of centuries of didactic interaction with the environment." If this be sense, make the most of it.

As an example of triumph of words over meaning, I have only to cite to you of Phi Sigma the words Orthogenesis, Rectigradation, Definite Evolution, and Aristogenesis. Surely those who invented the words had "heard that strange song Apollo sang when Ilion like mist arose in towers." One idea and four or more words plus pages of elaboration to confuse the student and burden the literature.

And now, if you will grant me your patience for a few more minutes, I will speak to the third of my categorical sub-headings. 3. *The synthesis of human experiences*. The torch of knowledge has, with a weird biological ability, increased and multiplied until it is no longer a single, flickering gleam but has become a multitudinous, complex, not to say messy *torch-light procession*, with a thousand seemingly unrelated trends utterly appalling to beginner and veteran alike. The accumulation of human experience is so vast that the day has long gone by when a single mind's ability could compass even a small portion of it. And yet it is imperative to remember that it is by the synthesis of the results in different fields that progress will be made. Unhappily, no student can begin at the point where his leader left off; he or she must begin at the beginning and learn it all anew. Despite all the tricks and methods of modern education, the process is hard and time-consuming. The beginner must master all the details of one small branch of knowledge as an essential to success. He must specialize to insure success. A most tempting definition of specialization is: the most direct route to the ability to buy the baby, or, in these days, the father, a shirt.

Specialization means formalization in methods and in habit of thought, in conformance with concerted regulations for the production of a dissertation. Your speaker will never forget the time that he suggested to a candidate for the Doctor's degree that he test certain possibilities, very germane though a little to one side of his subject, and was met with the horrified reply, "Why, I haven't the time to go into all that, *I have to write a thesis*." The demand for intensive treatment of the minute point cuts the student off from any appreciation or acquisition of related subjects. He is largely denied a knowledge of literature, which would place at his command illustrative material and teach him how to coin a forcible expression that would drive home a point. I have drudged through many a candidate's dissertation and noted many a case where pages of illy expressed presentation could have been better stated by quot-

ing a single verse from the book of Proverbs or Ecclesiastes, or a few lines from Shakespeare.

I have helped to train many students in two or three branches of science. I hold it as one of my greatest achievements that I have introduced a few of them to the King James Version of the Bible, to the writings of Lewis Carrol, and have led a few to read something of Robert Browning.

The dreary dead walls of recorded observation of minutiae hide the wide horizons of possible correlation of seemingly isolated facts. I will always remember the words of Doctor T. C. Chamberlin, the last great giant of geological science. He was being criticized by specialists for his rather broad summarizations and conclusions and was being called upon to document every step in the logic of his results. He stood towering before the audience and declared, "When I am called on to admire and appreciate the glories of a magnificent statue or a vast cathedral, I do not begin by examining a fold of drapery or by peering into the key hole of a side door of the cathedral." He and his great colleague, Doctor E. B. Wilson, the biologist, were among the last of those who could rally to their use much of the accumulations of human experience and call to their aid the classics of art and literature to express their thoughts in readable and pertinent English. Such men are rare and will become, I fear, increasingly rare until they threaten to join that group of things so dear to the heart of a paleontologist, the extinct species.

You say that I ask the impossible in asking for a useable grasp of human experience by one mind. I admit that it looks like it, but the seemingly impossible has been accomplished. Some one made a string stay put, somebody or bodies released atomic energy. Somebody will master the method of synthesis of human experience. The day of miracles is not past, it us upon us even now. You are restless in your seats, enduring the caviling of an elderly and bemused worker. I have no palliative and no apology, — you asked for it. He is but one of a long procession of those who have kept faith through years of seeming futility and failure. One of that group, again a

geologist of good repute, growing older and becoming anxious to hasten the days of the promise, declared, "I am getting old and tired. I am going to quit work and begin to pholosophize." That is a fatal stage in most workers' lives. Many can add a brick or two; few can complete a symmetric edifice. How many of you have completed a reading of a recent book called *Evolution a Modern Synthesis*?

Repeatedly the demand for breadth in training has been emphasized. Even University faculties have suggested that the principle be recognized in the formation of curricula. The demand has been answered in two ways. First by the inquiry, How, if the student does not specialize and get a job, is the demand for infant lingerie to be satisfied? Second, anyone who dares step out of line and seek aid in his neighbor's discipline is promptly thrown into disrepute and called a "straddler." "Straddler" is a term of anathema to all whose horizons are limited by the minutiae of their field. We all remember the stricture cast upon a man who dared step beyond his assigned bounds and seek truth and inspiration in his neighbor's field. It was said of him that he was not a scientist but a straddler, and that the depth of his learning was in inverse proportion to the width of his straddle.

Take notice, — students, specialists, rut-bound veterans! The straddler is the coming scientist. The one who has the vision and energy to look beyond immediate concerns. The one who can discern important facts and relations in the vast accumulation of human experience. The one who can tell the story in quotable language and can drive home his points with apt citations. The roster of leading scholars is the roster of such men. The aim of education is more and more to produce such workers. The student should be avid to grasp all opportunities.

To me these three points are the essentials of advance: (1) knowledge, (2) ability to present results, (3) itching brains that, like itching feet, cannot keep from foreign fields.

Above and beyond all the trite matter that I have dealt out to you there is a phase of progress very apparent to me, which my experience and con-

versations have taught me is far from being grasped by those whose major interest lies with the humanities. To you, members of the Phi Sigma Society, whose interests and training lie along biological lines, it will be more understandable. Perhaps it should not be said here. Perhaps the proper place for it is in my great, contemplated, posthumous and unpublishable book, to be called *The Brutal Truth*. Previews of extracts from that book, offered to a select few, have been met with expostulation rather than acclaim.

Humanity has accepted with smug meekness and laudable modesty the assumption that we humans have some attributes which set us off from other animals. Even if we refrain from discussing the teleological proposition of the possession of certain supernatural attributes as a matter of faith, and not to be tested by our still crude methods of logic such as we would apply to a scientific question, and consider only man's superior mental ability, — still there is the conviction that man, who has the floor, who does the writing and talking, is *de facto* the superior creature. The conclusion is based far more upon the assumption than upon any unbiased judgment. It resembles strongly the argumentative process of the mate who, in Lewis Carroll's *Hunting of the Snark*, asserted that when a thing had been repeated three times it became, *thereby*, true.

I cannot leave the subject of logic and faith without reciting to you a quotation from Coulton's *Medieval Panorama*. He cites John the Scott (Johannes Scotius Eriugena), about 850, a wise old early scholar of Charlemagne's time, who "reconciled theology and philosophy in his own mind only by contending that however they seemed to conflict, they were various aspects of the same truth; that the light of truth is iridescent, always the same in itself, but showing a bewildering variety of colors to the human eye according to the angle from which we regard it." There could be no better curative for a troubled conscience.

Humanists seem to have an idea that the human mind is now complete and perfected; that it is now capable of casting aside, by a mental effort, all

the predispositions, inhibitions, and lusts that we have inherited from our early experiences; that, if only a proper slogan could be devised, all human weakness and evil tendencies would cease and that the ideal would prevail. Every biologist must recognize that any fundamental and enduring change in mental, and hence in moral and ethical attributes must be as slow as any physical change. It is the old trouble,—every humanist and scientist, dealing with the present, sees the world around him only in the horizontal plane of the *now*. Things are complete at the moment and are so to be accepted and interpreted. Only the paleobiologist and the philosophical historian grasps the picture of life in the vertical plane of time, the *now and all* that has contributed to its being.

I have been involved in many a discussion on the improvement in mass mind and morals, and when I have said, "Give me fifty thousand years and I will show you a man much improved in sweet reasonableness," I have been received with incredulity and derision. As in physical evolution, mental evolution is at a variable rate in different individuals and communities. Your speaker has traveled somewhat widely and much of his travel has been in areas burdened with a surplus population of low intelligence. The situation is somewhat appalling. Hundreds of thousands, aye! millions live with a minimum of food and shelter, but cease not to increase and multiply. Each parent struggles to feed and shelter a brood that can only continue in the same line, but with the additional handicap of more mouths to feed and more bodies to shelter. The leaven wherewith to leaven two billions of people is small indeed. Dampier's 3rd edition of the *History of Science* says, "The destruction of a very small proportion of the world's population would suffice to annihilate scientific knowledge and lead us to almost universal belief in magic, witchcraft, and astrology." The torch of knowledge is far too faint to illuminate the world. The torch-light procession is but a minimal fraction of the great mass of men which, ever increasing in numbers, marches along the path of the precipice which leads

only to death. The main activity of the ignorant races, ever verging on starvation, is to increase and multiply, making the struggle for life ever keener and the threat of death by starvation ever more present.

It is the concern of everyone with any knowledge of biology to teach that change for the better will come relatively as slowly as any change in physical form or quality. Nor slogan; nor convention; nor peace treaty will do away suddenly with bad morals, bad manners, bad conduct, *bad humanity*.

Let us return for a moment to the last sentence quoted from Bingay's column: "We must first see to it that young men and women are trained to an understanding of the science of government and the fundamentals of economics." I think that everyone will agree that Science has in all its disciplines gone far ahead of the humanities, such as government, economics, and education, in collecting data, recognizing laws of action, devising dependable systems of logic. Perhaps this is because Science deals with far more dependable things than the human mind with all its variables. It took but a few years to marshall physical equipment for the crushing of two great nations by the force of applied Science. Think you that peaceful relations can be conceived and instituted in thrice the time? It will be nearer the fifty thousand years that I have asked.

The Science of Government seems to be largely occupied with civil and international strife. Its firmest established principle is that God is with the strongest and the shrewdest. The fundamentals of Economics seem to assume that costs of production and distribution can rise and prices remain the same. Surely such principles cannot be suffered to endure by intelligent beings. Is it not fair to ask ourselves whether human advance has not been as irregular as physical evolution? One phase of advance has outstripped another. Should not humanity, conscious of its failings, put more emphasis on discovering and applying the laws that control human relations, if it desires to last long enough to enjoy the benefits bestowed by Science.

The elders of every generation have thanked God that they will not have to

live through the tribulations that will come upon their children.

Force and science will not bring out the best in humanity. There must be a more subtly hidden path to realization of the best in human nature.

The scientific mind is apt to be a little exclusive, not to say intellectually snobbish. It erects a little world of its own and fences it about with abstruse formulae and an imposing verbiage of sesquipedalian terminology. It forgives itself the lack of deference to social conventions and often seems to think that brusque language, questionable finger nails, and a poor hair cut are marks of genius, or at least devotion to science. Such devotees smack strongly of the desert eremites who lived in filth, or sat on a high pillar, or lay on a bed of sharp spikes,—all for the glory of their God or gods. Should not such folks, "even as you and I," give of their experience and skills in collecting and utilizing data to help mankind in his everyday problems of life? To more satisfying solutions of the problems of the shirt, the nylon hose, and the day's meal?

Adult Education, in the minds of many thinkers, is essentially the education of the mass, the grocer, the butcher, the barber, the teamster, the miner, in the difficult problem of living together. Should the demand of each Union for increased pay and privilege be a demand for an increased burden on his neighbors? Should each strike be a knife in the back of every other Unionist? Should not the intelligent members of the world's family recognize that technical advance is far ahead of social understanding? Should they not realize that it is now essential to put more thought on the art of living, until we have gained a mastery of the laws of our social being at least equal to that we have gained over the inorganic world and the non-human life of our planet?

The problem is before you and your successors. Solve it you, or see the proud edifice of civilization vanish in smoke and dust!

So much for the Torch, which has changed from a shining symbol of promise to a badly organized flambeau procession. Now a bit for the Tin Can. A tin can tied to a dog's tail keeps him

running till he drops. Just that bald statement is my *apologia* for neglecting a certain patch of lily pads on a lake I know, and going daily to my office to pound upon a typewriting machine that is nearly as old and cranky as its owner, and which is responsible for about half of the mistakes in my manuscripts. It is the *apologia* for all men in my position, who have received a considerate hint, jellied with kind words, that they go a long way back and sit down where they will not get under the feet of the young and vigorous. It's all right, it is proper, and there is no complaint. The bulk of the work is done and the emeritus professor can heartily join with the Central American who gave great thanks to the good God who made the night for us to sleep in and the day to rest in. Such a conclusion is doubly welcome to one who, like your speaker, came into this world sufficiently far south to be *born tired*. But, and there is an unpleasant "but" in every ideal program, the tin can has been for years clanging in the rear and driving on to activity. The Duke of Wellington is said to have remarked that habit is ten times as strong as nature. He referred, of course, to the effect of discipline and drill upon fighting men, knowing that a man does not advance into deadly fire because he is brave but because it has been drilled out of him to do anything *but* advance. Habit has become *first* nature.

Habit is the tin can interminably rattling and banging in one's consciousness. The habit to imagine, to question, to test, to fall down on a promising lead and automatically get up and try for a new one. The loved, dimpled darling of a pet hypothesis is not a thing to be dandled and petted and loved, it is rather a thing to be torn apart, dissected, eviscerated, sliced into sections, until it yields up the reason why it ticks or why it won't.

One has beautiful visions of days without alarm clocks for early classes, without committee meetings, without (shameful to relate, students). *Now* the *magnum opus* will be accomplished. Personally your speaker had more modest ambitions: he resolved that, if spared so long, he would devote the

next ten years after his retirement to correcting the scientific mistakes he had made in the preceding fifty. Unfortunately he confided this ambition to some colleagues and they unanimously declared that he had better reverse his figures, fifty years were hardly enough to explain ten years of his errors.

So through the declining years the tin can of habit rattles at the old dog's heels. Nearly every question he has raised has produced twenty more; rarely has there been a satisfactory answer. A little has been accomplished; the most important was a realization of the amount not yet known. May you all come to that stage.

I have taught many students and many subjects. I have specialized in geology and paleontology; I have put a few dents and some bad oil in the torch of knowledge. I have spoken to

many groups like this one, and have developed a habit of closing with a few lines from Browning that I would have in every scientist's consciousness. If a few have understood the words and grasped their meaning, I have indeed passed on the torch.

But what if I fail of my purpose here? It is but to keep the nerves at strain,

To dry one's eyes and laugh at a fall,
And baffled, get up and begin again,—

So the chase takes up one's life,
that's all.

While, look but once from your farthest bound

At me so deep in the dust and dark,
No sooner the old hope goes to ground

Than a new one, straight to the self-same mark,

I shape me —

Ever

Removed!



Adult Education and Our Civilization

Adult education is one of the most important questions of our day and one likely to have the most far-reaching consequences. Even before the 1939 war, its importance was recognized by educationists, by many agricultural, industrial, and academic associations, and even by certain governments. Extensive programs of popular education were indeed worked out; in some countries on account of the political requirements of the totalitarian regimes; in others as a result of that desire for emancipation which does honor to democracy.

The fascist regimes, both German and Italian, exploited the most personal and therefore the most invariable of the assets usually possessed by adults: the short time, after their day's work in the fields or the workshop is done, when they are free to think. By seizing upon this modest possession, those regimes managed to change rest into meetings, amusement into hypnotism, education into propaganda, and propaganda into drill . . .

When you are discussing adult education, you are in fact discussing no less a matter than the future of our civilization. Do we want to educate people for obedience? Do we want to educate them for responsibility? Are

we going to educate the masses as if they were a uniform conglomeration in which individuals are swallowed up? Or are we going to educate them as a group of living beings in which the freedom of the individual conscience to develop is not restricted by the group mind? Do we claim to relieve man's isolation by accustoming him to blind submission to the will of the herd? Or do we wish to bring him to take a conscious part in a culture which, while having regard for his personality, will inspire in him a sincere desire to be one with all his fellows?

If we decide in favor of education for responsibility, we shall have chosen the more difficult but, as I believe, the only true road. There is no better remedy for the terror of solitude than the principle of the universal responsibility of man on earth. "Each of us is responsible for everything to everyone else," is one of Dostoyevsky's most profoundly penetrating remarks. Let us make no mistake. If we choose education for responsibility, we automatically demand a culture based upon the sense of responsibility.—Jaime Torres Bodet, Director-General-UNESCO. From an article in *School and Society*.

THE PROFESSIONAL STATUS OF THE BIOLOGIST

By HERBERT KNUTSON, Department of Zoology

Rhode Island State College, Kingston

A profession is a calling or vocation requiring a high level of academic education for both entrance and performance, involving special technical training and application. Emphasis is on mental rather than on physical labor. But more is involved than certain formal, advanced education and apprenticeship standards. There is implied a high level of conscious moral values, ethics, and judgment, usually determined by its members, with the goal a betterment of the society which it serves. "Professional status" refers to the level of respect and dignity extended to members of a particular profession. Remuneration received by members of a profession is usually in proportion to the level of professional status enjoyed. What, then, is the professional status of the biologist?

Since the term "professional status" includes various levels or degrees of attainment rather than specification of a fixed qualitative measurement, the biologist's status may best be evaluated by comparison with that of certain other professions. It is granted that this is difficult because the "biologist" covers many fields, some of them borderline; for example: biochemist, biophysicist, medical parasitologist. Yet the important question even in these borderline fields is not whether these scientists are technically biologists, but, rather, how do they fare with respect to the level of professional status as compared with that of certain other professions?

The first profession that comes to mind for comparison is the medical profession which, like the lawyer, consulting engineer and others, has a distinct advantage because of close relationship with the public and enjoys higher standing because of it. The cure for the disease may be discovered by the bacteriologist, chemist, or phys-

icologist, but the physician is the one that prescribes it to the consumer public and the physician is the one to whom the public gives credit. The medical profession is also well organized with powerful associations constantly striving and on guard to maintain high standards as well as its own well being. In public relations, even in "comic strips," the "doctor" is portrayed as the savior from human suffering and death and his word is final in a wide field, even extending to choice of cigarette brands. "Doctor's orders" are among the most commanding. His code of ethics minimizes contradiction and competition. Remuneration is higher than that of any other biologically-related profession. To realize this, one need only compare the professional income of a college or university physician with that of a biology professor of equal training and experience; or a comparable situation between biologist and physician in an industrial plant. The number of medical schools, number of medical students and *which* medical students admitted, are carefully controlled. Whether or not the medical profession may have gone too far in exercising their power in certain cases is not within the scope of this paper. The emphasis here is that it has organized, has set a high level of standards, has done remarkably well in living up to them, has served society well, and has at the same time provided for its economic and social protection in many ways.

Next consider the professional status of the physicist and the chemist, which is closer to that of the biologist. Their professional societies are practically all academic. The objective is primarily to further the sciences themselves rather than to include direct concern regarding the economic welfare of the members of these profes-

sions. However, some chemical and physical societies define "Professionals" in their fields and concern themselves with legislation which affects them, and otherwise look out for their economic welfare. Like biology, and unlike medicine, advanced education in physics and chemistry is ordinarily administered in the regular graduate school of the college or university, along with that of dozens of other fields. Screening of prospective candidates is much less rigid as compared to medical school. In fact, in some graduate schools (but not at Rhode Island State College) graduate students are accepted or rejected by the graduate school without even consulting the Department where the student expects to major! Yet physics and chemistry probably enjoy higher status, i.e., greater public respect than does biology, because of better organized efforts to elevate their professions, coupled with the publicity received because of the recent highly technical war in which both fields made important contributions.

Now what about the biologist? Until recently, only very feeble attempts have been made to organize and bring the biological profession up to the status that it should have. But until recently almost all biologists were teachers with relatively few doing research. Any direct relationship with dollars and cents outside of meager salary was rare indeed. Biologists remained within the cloistered walls of an institution of learning and were not regarded as professional men in the sense of lawyers or doctors, most of whom dealt continuously with the public. A recent trend toward commercial application of biological knowledge by the biologist has changed this situation somewhat. The recent war has also helped, with biologists gaining recognition in many instances above that of first class technicians. Perhaps this trend is also because the biologist is commencing to want to have a voice in formulating policies involving his profession. In any event, there is a distinct trend toward raising the professional status of biology. When biology deserves full professional recognition, it will undoubtedly receive it. Do not expect a biologist to be recog-

nized as a "professional biologist" until he meets the definitions comparable to other well recognized professions. Standards and performance must be high, and maintained. The biologists themselves will have to keep striving for this goal. How may this best be done?

This can best be accomplished and coordinated by organized effort in the form of an organization. The American Institute of Biological Sciences has been started but its objectives are limited to the raising of the science itself. While this commendable goal helps the biologist indirectly, it does not emphasize the direct welfare of the biologist himself, so the Institute is only part of the answer. A young and growing American Society of Professional Biologists is concerned with raising the biologist's status, with direct concern for the biologist himself as well as for the science, i.e., its interests include such things as legislation affecting the biological profession, publicity on accomplishments of biologists, ethics, and other economic factors. Full membership status is limited to those who are considered truly of professional caliber, with training and experience equal to that of the physician, dentist, or lawyer. There is also provision for affiliate membership for those who have not yet qualified for full membership because of inadequate training or experience. Organizations with such objectives are new or unique only in a few professions including biology; chemists, geologists and engineers have had similar organizations for years.

In any discussion such as this, the question of licensing, certification, or registration must be considered, especially in the case of certain types of commercial biological work or that involving direct welfare of the public. Practitioners in many professions, such as medical, nursing, and legal, must be licensed (or its equivalent), based on the attainment of certain academic standards, other training and experience, and/or passing examinations. (Many non-professional practitioners are also licensed, such as electricians, plumbers, etc.). The arguments pro and con with respect to licensing always seem to run

about the same. The pros wish to protect the public's life, health, welfare, and pocketbook from the unqualified and fly-by-nighters. The cons usually are those who cannot qualify and often include much of the general public itself in certain instances. The cons accuse the pros of squeezing out competition, price setting, and depriving them of their inherent right to make a living. What is the trend of licensing (or its equivalent) in the various branches of biology? In certain biologically-related fields it is already common, as illustrated by arboriculture, pest control work, and in a sense,

high school teaching. In industry, licensing is apparently not greatly needed because the qualifications of the prospective employee are very carefully studied. In the case of certain governmental employees and where there is direct contact and service to the public, licensing has certain merits. Whether or not we like it, there is a growing trend to put everything on a legal basis and licensing (or its equivalent) is creeping on us in some phases of biology. In other branches of biology, such as college and university teaching, it is a long way off or may never come.



Some Obligations of the Urban University

The first and most important implication for the urban university is that it must be free. Since the community which it serves is made up of people of all walks of life, of all national origins, all races and all religious creeds, it cannot be the servant of any single class, church, political or social faith. It must be both non-sectarian and non-political. In short, it must serve all of the people and never fall into the error of giving greater or more devoted service to any particular group within its constituency. Its obligation is as great to the well-to-do as it is to the less economically affluent. Its obligation is as great in the field of general education as it is in the field of professional education. It has an obligation to people of all ages and cannot be considered a servant of the youthful alone. Certainly one of the great curses of some American institutions of higher education is that they have become institutions of one class, one group, one religious sect, or one political party. This is particularly true of the urban university which can easily come to be the institution of the less privileged groups in our society and thus has, in a sense, been guilty of perpetuating class distinction. Though an institution may very properly and honestly dedicate itself to the service of one group in our population, such as a single church or a particular national group, it is certainly a program which cannot be followed by an urban univer-

sity which is meeting honestly and directly the needs of an American community in which all citizens are thought of as being equal and with equal right.

The second great implication for an urban university is that it must face the problem of giving educational service to large numbers, since from its community many will present themselves for higher education, and it must be prepared to admit and to educate all who seek its services and who are qualified in mind, spirit, and the will to profit thereby. This fact implies that the urban university is not free to arbitrarily limit its total enrollment but must be governed in its decision as to its size only by the limitation of the support which the citizens of the community give to it and by the proper demand for its services. Though the urban university is by definition responsible for the education of very large numbers, it does not follow that it must necessarily fall into the error of providing less than the highest grade of educational service. All too frequently in the history of the American institution, large size has automatically brought about conditions which have in many cases destroyed some of the tangible and intangible qualities of higher education. I would hold, however, that this result is not absolutely inevitable.—Inaugural Address, President J. S. Millis, Western Reserve University.

FISHERY TRAINING AND RESEARCH IN THE UNIVERSITY OF MICHIGAN TO 1950

By KARL F. LAGLER



Determining age of a fish from enlarged image of a scale.

The University of Michigan shares guard duty for the morale of a great army of fifteen million and for a great natural resource. To a large extent the army is composed of the nation's devotees to the art immortalized by

All illustrations courtesy of Sport Fishing Institute.

Izaak Walton; its morale is dependent upon successful fishing, which, in turn, is based upon the nation's fisheries. Obviously, the task is tremendous if the interest of such a large group of Americans with diverse representation in every state is to be maintained. Fortunately, the load is divided among



Studying food of fishes.

many state, federal, and private agencies. In spite of this sharing, however, the University's role is one of great responsibility and significance. Its sphere of influence is not limited to the recreational aspect of fisheries, but is extended to the commercial as well. The latter not only bears on the welfare of this country but also on the well-being of many other peoples of our increasingly glutted globe.

The history of American fisheries, sport and commercial, parallels that of other natural resources. From beginnings of plenty and easy abundance, there is metamorphosis through exploitation to less and less. Nature gave the bounty, man had but to utilize or waste it if he would; he did both! Unfortunately, in these matters the need for wise utilization seems never to assert itself until depletion has set in. And, in this sense, depletion is serious for it means that use of the resource has taken crops which harmfully affect the stock and thereby the future take.

Obscure though the foregoing may seem, I am writing about fish management, which has as its objectives the controlled production of increased fish populations and the regulation of their cropping to give a maximum sustained yield to all who would partake — in other words, to shorten the time between bites and to keep it as brief as possible for anyone who would wet a line.

Fish management is in its infancy. It is an art rather than a science. Its development up to the present time has depended on knowledge from many sciences, however, and in the future it must utilize more and more of them and must carefully apply the scientific method in the process. In its growth in America since about 1850, fish management has been reasonable and logical. Nevertheless, its procedures have failed to give the desired results more often than they have succeeded. It was natural that early efforts at fish management should involve planting of fish

and restricting of catch; yet how blindly these means were used for some three quarters of a century with the hope that they might stem the decline in the fisheries. As one might expect, these procedures, like farming by rule of thumb, brought results which were fortuitously good, bad, or worse than bad. The period from about 1875 to 1925 must surely become known as the dark age of American fishery biology.

It is really only during the last score of years that these twin traps of stocking and of passing laws, conceived in reason and logic but miscarried by malpractice, have been subjected to critical thought and some experimentation. The practical result is current abandonment of many kinds of stocking and of many legal restrictions on catch, particularly in the warm-water fisheries. Perhaps a more important outcome is the liberation of the minds of fishery scientists for exploration of new means for improving and maintaining angling quality. Among the more recent developments are such things as population manipulation and improvement of the physical environment. In population manipulation, some or all of the fish in a lake may be eliminated or transferred to create circumstances more favorable to production. In environmental improvement, destructive forces, such as those of soil erosion, may be controlled.

The University is doing, and has done, much for the newer developments in fishery biology. Perhaps its greatest services are in leader and worker training and in basic research. Among its present assets for furtherance of these enterprises are a great heritage for work in aquatic biology, its teaching departments and museums, its research facilities and libraries, key state and federal fish research and management units on campus, and funds for investigations available from the State, the Federal Government, University endowments, and outside sources.

The University's great heritage in fishery biology was founded in the work of the late Professor Jacob E. Reighard. Shortly after the turn of the century, Reighard was giving technical counsel to the State and to the Federal Government on fish matters



Obtaining water sample.



Recording vertical temperature series in a lake.



Measuring water transparency.



Sampling bottom for fish food organisms.



Collecting plankton for study.



Sampling fish population by seining.

and organizing early fishery surveys. Beginning in 1904, he taught a course in fish and fisheries of Michigan. Many will also remember Professor Reighard for his studies in fish behavior and as a teacher of such premedical subjects as Comparative Anatomy. Although primarily a herpetologist, President Ruthven made contributions of note to the early growth of fish work at Michigan through his roles as Professor of Zoology, Director of the University Museums, and as leader in regional natural history surveys. Early in the 1920's, the fostering of fish work in the University passed to Carl L. Hubbs. Under his direction, great advances were made in teaching and research, and the Museum of Zoology's huge collection of more than two million fish specimens was for the most part built up by him. The collection affords the greatest opportunity in the world for the study of American fresh-water fishes and is becoming more comprehensive daily.

During the early 1930's, in addition to his continued and outstanding work in systematic ichthyology and in the training of many workers on fish, Hubbs established the Institute for Fisheries Research of the Michigan Department of Conservation. Growth in function and importance of the Institute was so rapid that by 1935, Dr. Albert S. Hazzard was called from his position with the United States Bureau of Fisheries to become director. Dr. Hazzard is still in charge of this unit, and it now comprises a large staff of scientists and workers, many of them Michigan-trained. The Institute is the fact-finding arm of the Fish Division of the State Department of Conservation and, as such, has an extremely important role in the planning and testing of management policies and procedures.

Dr. Reighard was interested in the commercial fisheries of the Great Lakes. John Van Oosten studied under him and has remained on campus in the Great Lakes Investigations of the United States Fish and Wildlife Service (formerly the U. S. Bureau of Fisheries). He has gained for us a great store of knowledge, basic for management, on the life ways of Great Lakes fishes and has effected important

regulatory measures. Among the latter, he has been the prime mover for the international treaty, which, it is hoped, may be completed between the United States and Canada to bring about better regulation of the fisheries of the Great Lakes. The future of these fisheries may well depend on the early ratification of this treaty. In 1949-50, expansion of the Great Lakes Investigations brought Dr. James Moffett, a former Michigan graduate, back to Ann Arbor to direct the efforts of an enlarged staff.

One of the important aspects of the training of a fishery scientist lies in the field of Limnology — the chemistry, physics, and vital relationships of life in fresh waters. Both on campus and at the University's Biological Station on Douglas Lake in northern Michigan, fish students have been able to secure training in this subject and its methodology under Professors Paul S. Welch and Frank E. Eggleton. In 1948 Dr. Frank F. Hooper joined the staff of both the Zoology Department and the Station for work in this field and in Fishery Biology.

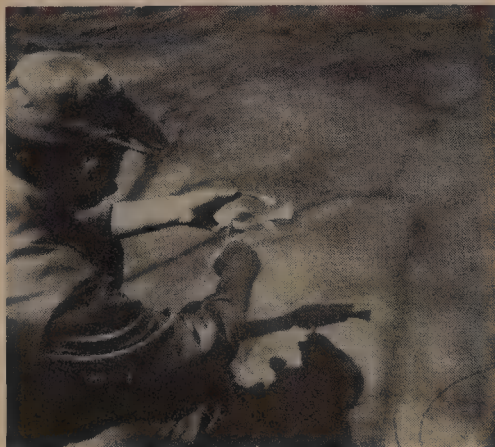
After several years of absence from the curriculum of the University, formal courses in Ichthyology and in Fishery Biology were reinstated in 1939. I was engaged for their reorganization, having just completed my training under Hubbs. This teaching work has been strengthened through the years to 1950 by increase in per-

sonnel both in the Zoology Department and in the Museum. Two curatorial positions in fish, created on Hubbs' departure in 1944, are now filled by Professors Reeve M. Bailey and Robert R. Miller, both of whom were contemporaries of mine under Hubbs. Student training is further enhanced and research augmented by the recent appointment of Dr. Hazzard and Doctors Gerald P. Cooper and J. W. Leonard of his staff, together with Dr. Van Oosten and Dr. Ralph Hile of his staff, to honorary positions as Research Associates in Zoology. Cooper and Leonard, proudly, are also Michigan products.

For the past ten years, research and teaching have been bolstered in the University by the Trust Fund for Fishery Research of the Associated Fishing Tackle Manufacturers. This fund, which I direct, provides scholarships, travel opportunity, research assistance, and equipment for graduate students and for the teaching staff in fisheries. Its support was taken over in 1950 by the Sport Fishing Institute of Washington, D. C. This Institute has as its first head, R. W. Eschmeyer, who did his doctoral work at Michigan in fish management. More recently, the Outboard Boating Club of America established a Fish Behavior Trust Fund in the University, which also affords research opportunities to both students and staff; Dr. Hazzard and I supervise the work under this Fund. Substantial



Analyzing water chemistry.



Marking a fish for future recognition.

support has also been given by the Faculty Research Fund and the Rackham Fund. The Great Lakes Research Institute of the University, recently formed, is instrumental in expediting work in the big lakes.

Present assets, carrying forward a great heritage, are considerable. Yet they are accompanied by liabilities arising from rapid growth and expansion of the technical aspects of the field and concurrent growth in number of trainees. Staff increases and expansion of teaching and research facilities are sorely needed as almost everywhere. Fishery work is scattered in four separate buildings. The University neither owns nor has control of experimental streams or ponds, either natural or artificial. An experimental trout hatchery is needed for both academic and applied studies. The only University-owned research vessel for work on the Great Lakes is a 26-foot converted army sea mule! Its use of necessity has largely been preempted by the Geology Department which secured it.

An important step has now been taken, however, which provides the foundation for solving many of these problems. As of September 1, 1950, the School of Forestry and Conservation has been enlarged into a School of Natural Resources with Samuel T. Dana continuing as Dean. Thus has been achieved a most creditable and noteworthy *first* by the University of Michigan.

The old School has long offered training integrated with work in fisheries. Of particular value has been the instruction of Professor Shirley Allen in conservation of natural resources and of Professor Warren W. Chase in wildlife management. The departments in the new unit initially are Forestry, Wood Technology, Conservation, Wildlife Management, and Fisheries. Work in fishery biology, particularly in fish management, thus transfers from Zoology, although certain fundamental

researches in aquatic ecology and physiology continue to be supported by the Department of Zoology. I have been appointed Chairman of this Department and, by special arrangement with the U. S. Fish and Wildlife Service, Dr. John Van Oosten is to give work in commercial fisheries. The work of this new department is strengthened by the offering of work in fisheries in summer field sessions at the Natural Resources Camp, Camp Filibert Roth, and by supporting courses in the University's Biological Station, both in the northern part of Michigan.

This new administrative framework begins to meet some of the needs for re-organizing fishery training and research. Although housing and staff are still inadequate, the School of Natural Resources stands out as a pioneering enterprise. The nearest approach to such an organization is the School of Fisheries at the University of Washington (Seattle, marine work). Thus, the University of Michigan, more than ever, is a leader in the work of fisheries as well as other natural resources.

Graduates from the Department of Fisheries will have B.S., M.S., or Ph.D. degrees. Employment opportunities are many in management, research, teaching and consulting. Most graduates will find employment with state conservation departments and with federal services such as The Fish and Wildlife Service, The Soil Conservation Service, The Public Health Service, river valley authorities, etc. Some will enter college and university teaching, conservation education, and outdoor writing. A few will also find employment as consultants to private individuals and agencies. They will be trained in the regulations of fisheries, cropping, fish culture and stocking, environmental improvement, integrated land and fishery management, and in the physiology, natural history, and ecology of aquatic organisms.

BOTANISTS PROTEST AXIS DEER ON HAWAII

By CHARLES E. HOGUE

Island botanists went into action yesterday to protest a project of the board of agriculture and forestry to transplant a herd of axis deer from the Island of Molokai to Maunaloa game reserve on the Island of Hawaii. They said the introduction of deer onto the Big Island would imperil native seed plants, 1,633 of which grow nowhere else in the world.

Colin G. Lennox, president of the board, said this danger had been taken into consideration and that the herd of deer would be kept under close observation for a period of four or five years and would be destroyed if it was shown to be a menace to native flora of the Islands.

* * *

PROTESTS AGAINST the introduction of deer to the Island of Hawaii were made by William H. Hathaway, graduate assistant, department of botany, University of Hawaii, and Otto Degener, botanist and former Hawaii National Park botanist. Aid of the National Parks Service in opposing the project would be sought, Degener said.

"One of the chief glories of the Hawaiian Islands is the magnificent flora here," Botanist Hathaway said. "Of the known 1,739 native seed plants, 1,633—94.4 per cent—are found here only. They are irreplaceable. Unfortunately, hunters probably outnumber the naturalists. I do not believe this always will be the case. There is increasing public interest in state and national parks. I believe that future generations of Hawaiians will be grateful for any efforts that are made today to preserve from destruction the native flora and fauna."

* * *

"IT HAS taken millions of years for plants to adjust themselves to the peculiar conditions found in the Hawaiian Islands," Naturalist Degener said. "As a result 98 per cent of the native plants have become different

from plants elsewhere in the world. And many of them are known only on a lava oasis along the Saddle Road on the Island of Hawaii. Among these is the primitive sedge *oreobolus*, the 'missing link' called *kokio* and the simple leaved 'mamani.'"

Both botanists stressed the value of the seed plants as earth cover that attracts rain and augments Hawaii's water supply. Mr. Degener said he had made personal observations on Lanai and Molokai that gave evidence that deer destroyed native plants. He said he was told by old Hawaiians that the grassland areas of Western Molokai were formerly forests, and that *nesoluma* and native *gardenia* trees he had seen there in 1928 were gone when he re-visited the area last year. Deer and cattle had destroyed them.

* * *

BOARD PRESIDENT Lenox said his department's experience with goat control on the Big Island and the fact that two professional hunters, with dogs, were able to control deer on Molokai when they became too numerous, convinced him that the Hawaii experiment can be undertaken safely. "The herd will be placed on a *kipua*—an area of lava on which vegetation has reappeared—*kona* from the Saddle road and separated by miles of barren lava from the Hawaii National park area," he said. "We will have to install water tanks there before the undertaking can start, and we are going to ask the legislature for authority to make hunting regulations, such as those which now apply to birds. Thus we can prevent an over-abundance of deer through the creation of hunting seasons as they are required."

"This plan has worked successfully in relation to wild goats and sheep on the Big Island. Since we started our program of trail building and guide service for hunters the goat population has been reduced so materially that we

were compelled recently to declare a six months closed season.

"The axis deer is a tropical animal which does not feed in the highland forests and does not multiply as rapidly as Mainland species of the deer family. It has only one fawn a year. There is a sufficient hunting interest to insure its control, I am sure. However, the first herd, effectually hemmed in by barren, waterless lava, will be carefully studied before deer are planted elsewhere on the Big Island.

■ * *

"BECAUSE THE axis deer feeds below the forests, in what is known as the 'B' zone, we took into consideration the possibility of crop damage. A field party made a study on Molokai and received assurances from the residents there that the deer were not a pest."

Vernon K. Peck, chief of the division of fish and game of the board of agriculture and forestry, said one element of the problem was the fact that while hunting seasons might be declared, some property owners would not permit hunting. This could result in an over-abundance of deer in certain localities, just as there are too many wild pigs and goats in such places. There is also the National Parks policy of prohibiting hunting on park lands.

* * *

MORE WARNINGS OF DANGER OF DEER TURNED LOOSE ON HAWAII

Editor The Star-Bulletin: The Hawaii Audubon society wishes to add its note of protest to the plan to introduce deer to the island of Hawaii.

That the propagation and activities of the goat population on the same island could not be controlled was affirmed in an address to the society by a wildlife management expert employed by the territorial board of agriculture and forestry. And there is no reason to believe that any attempts to control the deer population will meet with any more success.

If such an introduction is carried out, the territory is risking not only the loss of many unique and valuable plants, but of upsetting the ecological balance of the island, which is usually precarious at best.

Otto Degener has written of the denudation of forests on Molokai by deer.

The introduction of rabbits to Lay-

san island is another classic example.

The island of Hawaii may profit by their example, before experiments are made which may result in irreparable damage.

Very truly yours,
H. PAUL PORTER,
President.

* * *

MORE ARGUMENTS AGAINST DEER-LOOSING

Editor The Star-Bulletin: This is a third letter pointing to the danger of loosing Axis deer from Molokai in the "saddleback" district and forests of the island of Hawaii.

These deer will invade the lush forests and certainly destroy many plants and shrubs.

These native Hawaiian plants are now in tune with their environment. Each kind, according to its special creation by adaptation, covers lava flows, valleys, or ridges.

Thus they very efficiently accomplish three very practical functions.

First by their wealth of fibrous roots and fallen leaves they entrap rainfall, so that it will seep into our artesian basin to be stored there for man's need rather than tumble makai in wild torrents to be wasted in the sea.

Second, they actually entrap and condense fog into raindrops, thus augmenting our artesian water supply in a second way.

Anyone can see this happen off the Saddle road west of the Humuula sheep station. There most of the native mamani trees have killed—as expected—by grazing, but wherever a survivor stands in solitary splendor, the grass beneath is lush and green from the drops of water falling upon it whereas beyond the spread of the branches all is dead and seer.

* * *

The third and most surprising means by which plants increase our water supply and incidentally improve our climate is to "invite" rain and other clouds to pass over them.

Where the ground is bare of plants, a column of hot air rises to mushroom out and push the clouds away. Many a thirst-crazed mariner on a barren waterless island has seen a cloud actually

shedding rain come toward him only to split in half, bypass his island, and beyond it coalesce again.

* * *

Most of these Hawaiian plants, beyond their value as traps for water, have little practical value.

We can not eat them. But is an inspirational hymn like "Onward Christian Soldiers" of no value because it gives no food to the body? Plants, like hymns, feed the soul. Surely there is more to life than eating sugar, pineapples, beef and venison.

These inedible plants have an inestimable scientific and esthetic value.

They make these islands just one

enormous botanical garden so uniquely famous as to draw to them scientists from as far away as Sweden.

Deprive us of our unique plants, a volcano or two and our kindly Hawaiian people and the mainland tourist may just as well travel no farther than California or Florida.

OTTO DEGENER, Naturalist,
Waialua, Oahu.

(Biologists who are interested in adding their word of protest are requested to address their letters to His Excellency, Governor Stainback; the Editor, Honolulu Advertiser; the Editor, Honolulu Star-Bulletin; Mr. Colin Lennox, Board of Agriculture and Forestry,—all of Honolulu, Hawaii.—Ed.)



Coordination Sought in College Studies

The traditional college student, after having completed a few required courses, follows a cafeteria style plan of study. He picks, with certain minor restrictions, whatever course seems to contain material that may interest him; such a procedure of intellectual browsing has its undeniable advantages. But it is not only wasteful of time but leaves the student in the end with an uncoordinated jumble of information.

Some colleges have tried to meet this problem by making more courses required, thus limiting the free choice of the students, but this does not solve the basic problem.

What is lacking is coordination. Each course, excellent in itself, floats about as in a vacuum unrelated to every other course. . . .

The Claremont Men's College is undertaking the difficult task of assisting the student, from the very beginning, to coordinate what he learns in the various courses into an intelligent, integrated understanding of the world about him. This is no mean task. It places a heavy burden upon the teaching staff. Each faculty member must keep himself informed of the material discussed in courses offered by his colleagues and of the method of treatment

followed by them. In no other way can any individual instructor guide his students in linking together what he is studying into a well-balanced whole.

Each faculty member, after consulting his colleagues, discusses the central topic of the course from the point of view of his special interest.

In the Men's College, a student taking a course in economics does not study the economic theories and problems as if they were unrelated to the historic, political, and international situations that characterize the period in which the economic theories were developed and gained acceptance. He is led to see all these factors as related. He begins to learn the interrelations between economic, political, and international issues.

Because of this emphasis on current coordination, practically all courses are required. In no other way can a more or less uniform background of knowledge among the students be assured.

At the end of the four-year program, the student is required to pass a comprehensive examination. The coordination of the various subjects he has studied during his academic career is no new experience for him.—Professor J. Anton de Haas, in *The Christian Science Monitor*.

EDITORIALS

A GOOD YEAR — OR A BAD ONE

Some people accept recognition or honors as if they had them coming — and without entailing any responsibilities or obligations on their part. Lots of us Americans are that way. So much of everything we have or are has been given to us by our parents, our home towns, our country, that we have gotten ourselves into the frame of mind that is best typified by Don Marquis' immortal character, Warty Bliggins, the Toad. Warty believed that everything existed for him. One day Archy the Cockroach asked him why the Creator of the universe was so interested in him. Warty Bliggins' reply is a classic: "Ask rather what the universe has done to deserve me!"

Membership in Phi Sigma is supposed to be an honor. If the whole Society is made up of scientific toads, then there will not be much honor in it for anyone. Read the extract from the Phi Sigma Constitution which appears at the head of the back cover. "It should be considered as a working guild of biologists interested in research." Please emphasize "*working guild*." Then read on to "*an opportunity for better work!*"

In those two expressions we have the essence of Phi Sigma success. Where over a period of years initiates were carefully indoctrinated with these altruistic ideals, the chapter history has been one of continuous success. Wherever chapters have failed, there is no mystery about the reason why. They forgot the challenge of Phi Sigma, "an opportunity for better work."

First among those opportunities is the biological work one is in the university or college to do. Close on the heels of the scholastic challenge comes that of extrascholastic activities, those powerful adjuncts of school life and experience.

Among the most important of such interests for a biologist should legitimately be Phi Sigma, which offers so many additional avenues for self-sacrificing and most truly altruistic action.

First of all come chapter obligations, attendance at meetings, participation therein, cooperation and a lot of team work. Second, but not less important, is cooperation in the work of the whole Phi Sigma family. Much of this phase of chapter work falls on the shoulders of the duly selected, and elected, chapter officers. Among the interchapter obligations of officers none are more important than those of the "companion officers," — the Chapter Secretary with the Council Secretary, the Chapter Treasurer with the Council Treasurer, and the Chapter Editor with the Council Editor.

When the relations between these officers is perfect, or nearly so, the affairs of Phi Sigma move smoothly. The whole society prospers, and that prosperity is shared by every chapter, and every chapter member.

This can be one of the best, or of the worst, years in the history of Phi Sigma. It all depends on the kind of people who make up the chapters, the kind of officers who represent them and the kind of motives that animate everyone concerned.

HERE WE GO AGAIN!

This editorial is being written hard on the heels of the American Council on Education meetings in Washington, D. C., which the Editor attended in his capacity as dean of a college of liberal arts. While it is still too early to evaluate all that transpired in the Washington sessions, a few things seem to stand out and some are good, others distasteful.

For one thing, the educational world has no intention of letting the armed forces or the civilian defense economy get ahead of the colleges and universities in their long-range planning for eventualities.

Accepting the inevitable conclusion that this land of ours has entered a "gray" period that may last for a few years at the least, or a generation at the most, American education is literally "hitching up its galluses" and

tightening its belt in the face of whatever may be in store.

What effect this more or less extended period of cold—or not so cold—war is going to have on Phi Sigma is not merely a moot question. It is a real live issue that must be faced.

At the Dallas meeting during the 1941 Christmas holidays some of the guests were already in uniform, as might have been expected in the same month as the tragedy of Pearl Harbor. Will it be that way this year at our annual meeting? No matter what happens, it is perhaps best for Phi Sigma to come to this winter's meeting firmly determined to carry on, and to lay effective plans accordingly.

It may be that the economic situation will call for retrenchments, that the militarization of education may cut the enrollment at many schools. Whatever the case, there is one ray of sunshine in the present plans of the military services. They do not intend to keep their officer candidates

out of student activities. It is contemplated that the men and women who are majoring in biological fields—even though in uniform—will be able to participate in professional and scholastic organizations. If the proposed use of the AGCT (Army General Classification Tests) and the 50%—66—75 student retention percentages go through, it would appear that only the most accomplished students will be among those who are exempted from the draft. Those who major in the biological fields would then be logical candidates for membership in Phi Sigma at least from the scholarship angle. Since all the branches of the armed forces are going to need biologists directly or indirectly, the next few years should not be too hard for biology and our biological society, Phi Sigma.

READ
THE
INSIDE
REAR
COVER



OBITUARY

Dr. Melvin Amos Brannon, 84, internationally known botanist, died in Gainesville, Florida on March 26.

He was born in Lowell, Indiana, September 11, 1865, son of the late James and Eleanor Foster Brannon. He received his A.B. degree at Wabash College in 1899 and his A.M. degree the following year. At the University of Chicago in 1912, he received his Ph.D. and at Whitman College in 1917, his LL.D.

Dr. Brannon organized the public health laboratory at North Dakota in 1909 and has been an honorary trustee of Beloit College since 1923.

Besides holding several professorships at the University of North Dakota from 1894 to 1914, he was dean of the College of Liberal Sciences at the university from 1911 to 1914. Following this he was made president of the University of Idaho from 1914 to 1917, president of the Beloit College from 1917 to 1923 and chancellor of the

University of Minnesota from 1923 to 1933.

Dr. Brannon was president of the National Associations of State Universities in 1928. He was also a member of several scientific bodies and was Phi Beta Kappa, Phi Kappa Phi, Phi Delta Theta and Sigma Xi. He was president of the Florida Chapter of the latter organization at the time of his death.

As an author, he has published papers on marine algae, fresh water algae, "The Influence of Heat Upon the Maturation of Vegetables and Fruits," "Some Biological Phenomena of a Dying Lake" and "Some Myxophyceae of Florida."

As a resident of Gainesville since the late 1930s, he was past president of the Gainesville Rotary Club, having been an active participant in this city, and he has continued research in retirement at the University of Florida.

NEW BOOKS

This section offers brief uncritical reports on the general content of recent publications in biological and related fields. Only the longer critical reviews will be signed. For quick location on library shelves, each notice will be preceded, wherever possible, by three groups of numbers, the first two of which will be the Dewey and the Library of Congress classified numbers respectively. The third group is the L.C. card number, for the convenience of Librarians.

GRAY'S MANUAL OF BOTANY, by
MERRITT LYNDON FERNALD, American
Book Company, 88 Lexington Ave-
nue, New York 16, New York, 1950,
1632 pages, 1806 figures, \$9.50.
581.973 QK117.G75 50-9007

This long-promised and equally long-awaited edition of the famous old "Gray's New Manual of Botany" has been twenty years in preparation. It replaces the seventh edition which appeared forty-two years ago.

While it is for the professional taxonomists to pick flaws or praise, we ordinary biologists and teachers of biology find in this new reference work much to commend. Many of the helpful and interesting features of the older works have been retained in revamped and up-to-date forms. Among these are the summaries of families, divisions, and so forth, the analytical key, the author and other abbreviation lists.

It is with the 1566 page Descriptive Flora section that most of us have business. First we notice that Dr. Fernald has no illusions about the decline of Latinity in modern scholarship. Immediately following each species name he gives its English translation in parentheses. This alone is an innovation worthy of attention and praise. Another is the noting of the full name and life span of any noteworthy for whom a species has been named. Still another innovation has been the figuring of the characteristic flower heads of some forms, e.g. *Solidago*, in outline rather than in details. Like its predecessors, this volume begins with the pteridophyta and includes all the ferns of the Central and Northeastern United States and adjacent Canada.

Covering more than 8000 species and varieties of vascular plants, this manual is the most recent, up-to-date and authoritative work of its kind since World War II. A.M.K.

ATOMIC ENERGY, by KARL K. DARROW, John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, New York, 1948, 80 pages, 13 figures, \$2.00.
541.2 QC173.D24 48-8465

Dr. Karl Darrow is Secretary of the American Physical Society and associated with the Bell Telephone Laboratories. In this little work he explains the structure of the atom in terms of protons, neutrons and electrons. Emphasizing the importance of the nucleus of the atom, he shows the difference between an ordinary chemical reaction and a change in the structure of the nucleus itself. Thence he proceeds to more complex subjects,—what isotopes are, how the scientist can bombard the nucleus and force it to transmute itself into the nucleus of another element, what radioactivity is, and how man has unloosed the self-perpetuating chain reaction.

BIOLOGY, A STUDY GUIDE, by
BLANCHE MCAVOY and HAROLD MOORE,
Burgess Publishing Company, 426
South Sixth Street, Minneapolis 15,
Minnesota, 1950, 193 pages, \$2.50.

This spirally bound, mimeoprinted second edition merits even more favorable attention than its predecessor. The experiments are well conceived and a number of them ring in changes on traditional classroom demonstrations.

BIRD LIFE, by EDWARD A. ARMSTRONG, Oxford University Press, 114 Fifth Ave., New York 14, N. Y., 1950, 152 pp., 23 plates, 45 figs., \$2.50.

598.2 QL676.A68 50-7039

Fascinating stories on bird life and behavior by one of the best-known modern British ornithologists, who, however, ranges world-wide in his interests.

CALORIE REQUIREMENTS, report of the Committee on same, Food and Agriculture Organization of the United Nations, Columbia University Press, 2960 Broadway, New York 27, New York, 1950, 65 pages, 18 tables, 75 cents.

Under the chairmanship of Professor Ancel Keys of the University of Minnesota, eight specialists from Illinois, Alabama, Netherlands, France Scotland, and Belgium, collaborated in producing this monograph on the caloric and nutrient requirements of human beings.

CANADA GEESE OF THE MISSISSIPPI FLYWAY, by HAROLD C. HANSON and ROBERT H. SMITH, Illinois Natural History Survey, Natural Resources Building, Urbana, Illinois, 1950, 210 pages, 82 figures, No price given.

Ecologists as well as nature lovers will be interested in this study of migrant geese both in their breeding grounds in the Hudson and James Bay areas, along their Fall and Spring migration routes, and in their wintering places from southern Wisconsin to the Gulf of Mexico. Numerous comparative figures and statistics are given. Losses and mortality factors, diseases and productivity are also discussed.

THE CEREBRAL CORTEX, by WILDER PENFIELD and THEODORE RASMUSSEN, The Macmillan Company, 60 Fifth Avenue, New York 11, New York, 1950, 248 pages, 121 figures, \$6.50.

617.48 RD529.P4 50-8617

Of general interest to the medical, anatomical, psychological, and physiological, but most of all to neurosurgical, practitioners, this detailed discussion of the results of some 400 craniotomies presents the latest results of large-

scale cortical stimulation by two outstanding members of the Montreal Neurological Institute. Operating under local anesthesia, the authors record the reactions obtained in the most typical cases, under the following headings: sensorimotor representations of the body; head and eye movement; vocalization and arrest of speech; secondary sensory and motor representation; vision; hearing and equilibrium; memory, sensory perception and dreams; and excision of cortical regions.

EDUCATORS GUIDE TO FREE SLIDE FILMS, MARY F. HORKHEIMER and JOHN W. DIFFOR, Educator's Progress Service, Randolph, Wisconsin, 1950, 128 pages, \$3.00.

Teachers, particularly at the high school level, who have projectors and believe in visual education, will be interested in this invaluable manual. There is not too much of biology in the science section.

FORGOTTEN ACRES, American Walnut Manufacturers Association, 666 North Lake Shore Drive, Chicago 11, Illinois, 1950, 36 pages, No price listed.

Circulated in the interests of the wood industry, this brightly colored pamphlet represents a very intelligent approach to timber conservation. High School teachers may find it specially useful.

FOREST PLANTATIONS IN THE LAKE STATES, by PAUL O. RUDOLF, Superintendent of Documents, Washington 25, D. C., 1950, 171 pages, 46 figures, 45 cents.

This technical bulletin (No. 1010) could well be used as a forestry text. It certainly affords forestry students additional factual data, so comprehensive are the problems which the Lake States Experimental Forest Station and its cooperators have met and, to some extent, solved. Particularly interesting to the ecologist are the discussions of climatic conditions, animals and insects.

EXPERIMENTS IN GENERAL BIOLOGY, by GRAHAM DU SHANE and DAVID REGNERY, W. W. Freeman and

Company, 549 Market Street, San Francisco 5, California, 1950, 182 pages, \$2.00.

Paralleling and to some extent based on Garrett Hardin's "Biology — Its Human Implications," this loose-leaf lab manual comes bound but with each page perforated for removal and punched for a three-hole binder. It is divided into five parts, somewhat interchangeable, and includes the structure and functions of vertebrates, kinds of animals, structure and functions of plants, — and genetics, ecology and evolution.

THE FETAL PIG, by GRACE E. HOLSTAD, Burgess Publishing Company, 426 South Sixth Street, Minneapolis 15, Minnesota, 1950, 32 pages.

Conceived as a guide to the dissection of the fetal pig, this spirally bound laboratory manual has been some fifteen years in the making. It aims to provide a self-helping guide so that once the student has gotten a start he can easily locate all the structures described by following instructions. Each of the exercises is planned for one two-hour laboratory period.

THE FUTURE IN MEDICINE, Columbia University Press, 2960 Broadway, New York 27, N. Y., 1950, 160 pp., \$2.50.

Five lectures by as many members of the New York Academy of Medicine, under the subtitle "The March of Medicine," discussing law and medicine, the endocrines, science under a dictatorship, blood and man, and the "Criminal Within Us."

HOW TO KNOW THE PROTOZOA, by THEODORE L. JAHN and FRANCIS FLOED JAHN, William C. Brown Company, 915 Main Street, Dubuque, Iowa, 1949, 234 pages, 394 figures, spirally bound, \$2.00, cloth binding \$3.00.

This informal production from the pen of the Professor of Zoology at U.C.L.A. is another in the Pictured-Key Nature Series. It has much to commend it. Not only are the plentiful illustrations large and clear, but they are often accompanied by detailed descriptions of the pathogenic effects of the protozoa concerned.

LABORATORY MANUAL OF MICROBIOLOGY, by GEORGE PELTIER and KEITH H. LEWIS, The Macmillan Company, 60 Fifth Avenue, New York 11, New York, 1950, 176 pages, \$2.75.

College teachers who are looking for a general course in the bacteriological area, without the usual pathogenic accents of the typical premedical courses, will be well advised to look into this manual. The experiments are grouped into three sections, — a survey of microbiology (structural), the growth and death of the organism (physiological), and the application of microbiology to the medical sciences. The book is spirally bound and offers enough blank pages to record laboratory findings.

MANUAL FOR COMPARATIVE ANATOMY, by LEONARY P. SAYLES, The Macmillan Company, 60 Fifth Avenue, New York 11, New York, 1950, 214 pages, 92 figures, \$3.00.

Strap bound, and of typical laboratory notebook size (8"x11"), this revised edition of a textbook, first introduced at the City College of New York in 1933, consists mainly of an outline with names of parts to be studied. It is arranged by various organ systems, subdivided into the series of animals to be studied. Depending on their presence or absence, these may run from only one as in the nervous system of the perch to twelve under the thoracic cavity of the cat.

ONE FAMILY, VITAMINS, ENZYMES, HORMONES, by BENJAMIN HARROW, Burgess Publishing Company, 426 South Sixth Street, Minneapolis 15, Minnesota, 1950, 115 pages, \$2.00.

612.0151 QP601.H32 50-7608

All four members of the family have each been considered in a separate section in this new work, which is based on the author's "Scientific Monthly" article of March 1947. It is simply written with no sacrifice of its scientific authenticity to its understanding by others who are not scientifically trained.

PROBLEMS OF MORPHOGENESIS IN CILIATES, by ANDRE LWOFF, John Wiley & Sons, Inc., 440 Fourth Ave-

nue, New York 16, New York, 1950, 103 pages, 32 figures, \$2.50.

593.17 QL368.C5L84 50-7741

Subtitled "The Kinetosomes in Development, Reproduction and Evolution," this slim volume from the Wiley Biological Research Series, covers the life cycle of *Gymnodenioides inkystans*, aspects of the kinetosome, problems of equilibrium, movements of the ciliary system in ontogeny and phylogeny, and differentiation in ciliates. The author is head of the department of microbial physiology, Institut Pasteur, Paris.

RESEARCHES ON THE AMPHIBIA OF OKLAHOMA, by ARTHUR N. BRAGG (and others), University of Oklahoma Press, Norman, Oklahoma, 1950, 154 pages, 5 plates, tables, \$1.00.

597.6 QL653.0505 50-4687

Three sets of papers, four taxonomic, four ecological, and two on sex cycles. Seven are by Arthur N. Bragg, three by Bragg and an associate. Two keys for the identification of the frogs and toads, as well as the adult salamanders of Oklahoma, are included.

STRUCTURE IN RELATION TO CELLULAR FUNCTION, by ROBERT CHAMBERS (and others), New York Academy of Sciences, 2 East 63rd Street, New York 21, New York, 1950, 194 pages, illus., price not given.

Eleven papers of a cytological or physiological nature from the laboratories of the Editor, Drs. Jacobs, Waugh, Claude, Brochet, Kopac, and D'Angelo among others, make up this monograph. They were selected from the Conference in the Section of Biology of the New York Academy of Sciences, 2-3 May 1947.

THE STUFF WE'RE MADE OF, by W. O. KERMACK and P. EGGLETON, Longmans Green & Co., 55 Fifth Ave., New York, N. Y., 1948, 356 pp., 75 figs., 8 pl., \$3.00.

574.19 QH331.K45 49-1582

It was nearly time the publishers came out with a second edition of this handy and practical summary of biochemistry which was reviewed with ac-

claim in this magazine some ten years ago. The book has been brought up to date on the advances of the past decade. The size has been reduced somewhat, so that it is more handy in the pocket, but for all that there are two more chapters than in the first edition.

TEPEXPAN MAN, by H. DE TERRA, J. ROMERO and T. D. STEWART, The Viking Fund, Inc., 14 East 71st St., New York 21, N. Y., 1949, 160 pp., 38 pls., 23 figs. \$3.00.

972.01 F1219.T37 49-2378

This eleventh Viking Fund publication under the editorship of Dr. Ralph Linton is in reality three separate treatises on the same subject, the 11,000-year old Tepexpan human remains, each approaching it from a different angle. In the first section De Terra handles the main theme of early man in Mexico from the geologic, stratigraphic and cultural standpoint. In the second part Romero discusses the physical aspects of the Tepexpan discoveries, giving most of his attention to the restoration of the skeleton. There are six appendices to this paper, each giving the official comments experts. Among these are Franz Weidenreich who discusses the anatomical characteristics, Samuel Fastlicht handles the jaws and dentition, Father Connelly explains the cranial cast, and William Laughlin reports on the serological findings. The last paper by T. D. Stewart discusses and makes comparisons between the Tepexpan man and other early Americans.

A WORKBOOK OF HUMAN PHYSIOLOGY, by JAMES R. BURKHOLDER, Pacific Books, P. O. Box 558, Palo Alto, California, 1949, 224 pages, 75 figures, \$2.75.

Filled with instructive diagrams, this laboratory notebook traverses all the human physiological functions from the animal blood and lymph streams all the way down to reproduction. Although it is spirally bound, the work is to be done in the laboratory, and plenty of space is left on each page for student activity.



DR. HAROLD W. WERNER, Sigma '29

Dr. Werner has been associated with The Wm. S. Merrell Co., Cincinnati, as Head of the Pharmacology Department since 1943. In his new post, he will be responsible for the direction and operation of all Merrell Scientific Laboratories.

Dr. Werner has a reputation of national importance in scientific circles. Between 1927 and 1941, he taught on the scientific faculties of the Universities of Florida, Duquesne, Wisconsin, and North Dakota.

He is a past Vice President of Rho Chi, a National Honorary Pharmaceutical Society, a member of the American Pharmaceutical Association, and numerous other national scientific groups.

Dr. Werner has published approximately 40 scientific papers dealing with pharmaceutical medicine.

A native of New London, Wisconsin, Dr. Werner received his B.S. degree in Pharmacy from the University of Wisconsin, a Master's degree in Pharmacognosy from Florida University, and his Ph.D. in Pharmacology at Wisconsin.

Responsibility Must Be Taught in College

You will not form the good citizen of a democratic state by knowledge of the truth alone. He is liable to be a pedant, a man isolated from the world in which he lives. Nor will you form him by good will alone; for good will alone is often uninformed, well intentioned but ineffectual. Nor will you form the good citizen of a democratic state by teaching him "behavior" like a veneer.

It is the function of colleges and universities in a democratic state not only to teach the history and theory of our American heritage but also to provide that kind of undergraduate experience which alone makes real the search for truth, the promotion of good will, and the issuance of these two in terms of responsible behavior. For "responsible behavior" is the crux of our problem. Many things can be taught out of textbooks in the historical manner; many others taught in the laboratory in the experimental manner. But one thing that cannot be taught by describing, isolating, or identifying it is responsibility. It is a mode of conduct—of behavior—which one learns as a by-product of daily life. Gradually it becomes a habit. If the assumption of individual responsibility is critical, as I believe it is, to the functioning of any democratic society, then those colleges which acknowledge an obligation to democratic society must provide the kind of daily experience which promotes responsibility.

I do not mean by "experience" merely a mock election or an exhortation to register and vote — when you come of age; nor yet visits to court houses and electoral stations and prisons and county homes. All of these are valuable. We need more of that kind of experience than we have. What I mean is that the college or university must so shape itself that its students live democracy in their daily life, fulfilling its laws of consideration, decency, honor, and assumption of duty. —From an address at Wilson College by President Paul Swain Havens.

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(*New elections shortly.*)

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The past season has seen a series of very excellent speakers at our monthly meetings. All who attended apparently enjoyed the lectures a great deal as was evidenced by the spirited discussion sessions which usually followed the lectures and during which members and guests are encouraged to ask questions.

We have had some difficulty in getting good attendance at the meetings, due primarily to the very keen competition offered by other societies and some very good seminars given on the campus. The seminars often present a speaker from another university (often an internationally known figure) and frequently three or four good lectures are given in biological subjects within one week. We hope to obtain better attendance by better publicity this coming year.

No scholarship award was made this year due to the dearth of theses and research reports by undergraduates. The University no longer requires a baccalaureate thesis. We plan to admit Master's degree candidates to eligibility for the next year.

Might I make a suggestion for the BIOLOGIST? Members often raise a question as to why THE BIOLOGIST does not contain more reports of research, etc. (i.e., more material other than chapter news). It is my impression that few members are aware that they are primarily the ones who determine what is to appear in the journal . . . or, if they *do* know that contributions are expected from them, they are uninformed as to the correct procedure involved in submitting items for publication, the nature of items to be submitted, and the like. I have just read over the old correspondence concerning this question. Particularly val-

uable was the report of the committee on THE BIOLOGIST at the Albuquerque convention as well as the May 1948 edition in which so much attention is given to the shaping of future policy in this regard, and in which appears the "announcement of a new publication policy." I was surprised to discover that Rho Chapter has no copy of this issue (I have it among my personal copies) and that the members (even of the executive committee) seemed to be rather uninformed of its content. As a matter of fact, the chapter has been rather remiss in this matter of filing copies of the BIOLOGIST. We possess but six copies of the journal in our files.

Here is the suggestion: Why not make such an instruction sheet as appears on page 21 of the May 1948 issue a matter for continual publication in each issue? Should any slight changes in editorial policy occur from time to time they can readily be made known to all the members.

It is our intention to have mimeographed copies of these same instructions sent to all our members this fall with an appeal for suitable contributions to the BIOLOGIST. It can not be hoped that the practice of mailing out this information will be continued here in years to come and likely it is not done in all other chapters. Having such information in each issue will apprise new members as well as remind old members of the nature of the journal.

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A High Regard for American Education

In attending the sessions of three international educational congresses in Great Britain the past summer I was struck by the fact that the problems facing higher education today are similar all over the world. Everywhere colleges and universities are crowded, but in spite of this fact there is an almost universal lack of the full financial support needed to meet in a complete way the postwar demands and opportunities for education. There is also a fine common determination somehow to make up as well as possible for the lost time of war years.

It is hard for those of us who live in America to realize how much growth there has been in recent years in the world-wide recognition of the high place of American education. Earnest young men and women in every land are now anxious to do everything in their power to secure the advantages of education in the United States. The basic freedom of our educational institutions, the distinction of our scholars,

and the excellence of our laboratories and our modern libraries are outstanding in their attractiveness to the able young scholars of the world. Today the lack of equipment and of modern books even in some of the greatest centers of education in the Old World is tragic.

These facts make it especially important that all of us who are concerned with American education should do our best to be worthy of the high estate in which we now find ourselves. . . .

Higher education in America must do its full share in preserving the freedoms of western civilization. American education must continue to give full emphasis to humanistic studies as well as to pure and applied science. America must train men and women who are informed and valiant in the defense of the ethical, intellectual, and cultural values that have made our western world great.—President Leonard Carmichael, in *Tufts Alumni Review*.

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ABSTRACTS: A brief summary of not more than fifty words must be separately presented with original copy for forwarding to *Biological Abstracts* as soon as the date of publication is determined. Summaries will follow the format used in *Biological Abstracts*.

ILLUSTRATIONS: Sharp photographs or clear line drawings *in ink*, NOT PENCIL, may be submitted. Lengths of articles should be curtailed in proportion to the extent of illustrations used. Cuts used will be paid for by the contributor at standard engraver's rates and become *his* property immediately after publication.

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Mile Posts

- 1915 March 17, Alpha Chapter organized, Ohio State University, Columbus.**
- 1916 May, Central Governing Body organized, BIOLOGIST first issued.**
- 1917 June, last War-time BIOLOGIST issued.**
- 1921 February, BIOLOGIST revived.**
- 1924 December, First National Meeting, Constitution revised, Washington, D. C.**
- 1925 December, Second National Meeting, First Science Program, Kansas City.**
- 1926 December, Third National Meeting, Second Science Program, Philadelphia.**
- 1927 December, Third Science Program, Nashville.**
- 1928 December, Fourth National Meeting, Coat-of-Arms adopted, Fourth Science Program, New York.**
- 1930 January, Council Meeting, Ritual Revised, Norman, Okla.
December, Fifth National Meeting, Fifth Science Program, Cleveland.**
- 1931 Phi Sigma Letters Registered, U. S. Patent Office.**
- 1932 December, Sixth Science Program, Atlantic City.**
- 1933 June, Sixth National Meeting, Seventh Science Program, Chicago.**
- 1935 December, Seventh National Meeting, Eighth Science Program, St. Louis.**
- 1937 December, Eighth National Meeting, Ninth Science Program, Indianapolis.**
- 1939 December, Ninth National Meeting, Tenth Science Program, Silver Anniversary, Ohio State University, Columbus.**
- 1941 December, Tenth National Meeting, Dallas, Texas.**
- 1946 December, Eleventh National Meeting, Boston, Mass.**
- 1948 December, Twelfth Meeting, Eleventh Science Program, Albuquerque, N. Mex.**

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